CLAIMS

*The invention claimed is:*

1. Dynamic connection structure means for transmitting packets between clients on a network.

2. Binary tree algorithm means for determining client connections in a dynamic connection structure.

3. Ordered binary tree algorithm means for determining client connections in a dynamic connection structure, wherein the positioning in the binary tree of nodes, which correspond to clients in said dynamic connection structure, is ordered by one or more characteristics of said clients.

4. A means of transmitting messages between clients in a dynamic connection structure, or between clients in said connection structure and external servers, or between external clients and external servers in a way which facilitates both the repetitive transmission of packets between clients in said dynamic connection structure and the repetitive reorganization of said dynamic connection structure.

5. A method of transferring a file between clients over a network comprising the steps of:

creating of a dynamic connection structure of clients;

dividing the file into packets;

transferring each of the packets sequentially across open network connections contained in the dynamic connection structure.

6. A method of generating a dynamic connection structure of clients comprising the order independent-steps of:

adding a node to an ordered binary tree using a binary tree addition algorithm, where the node added corresponds to a client which requires addition to the dynamic connection structure;

establishing a client's appropriate network connections based on the corresponding node's position in the ordered binary tree;

removing a node from an ordered binary tree using a binary tree removal algorithm, where the node removed corresponds to a client which requires removal from the dynamic connection structure.

7. The method of claim 6, wherein the positioning of a client's corresponding node in said binary tree is determined by one or more characteristics of said client.

8. The method of claim 6, wherein the positioning of a client's corresponding node in said binary tree is determined by said client's network connection speed.

9. The method of claim 6, wherein the type of binary tree addition algorithm used is an incomplete binary heap addition algorithm and the type of binary tree removal algorithm used is an incomplete binary heap removal algorithm.

10. The method of claim 9, wherein the positioning of nodes in the tree is ordered by one or more characteristics of said nodes' corresponding clients.

11. The method of claim 9, the positioning of nodes in the tree is ordered by the relative network connection speed of said nodes' corresponding clients.

12. A method for performing reorganization of a dynamic connection structure comprising the steps of:

sending to clients information which includes new connection information;

modifying said clients' active connections in a manner determined by said information.

13. A method of repeatedly transmitting data packets between clients in a dynamic connection structure and repeatedly reorganizing said dynamic connection structure comprising the following order-independent steps:

a client contacts a server to request addition to the dynamic connection structure;

a server transmits information including new connection information to a client;

a client transmits information including new connection information to a client;

a client transmits information including new connection information to a server;

a client in said dynamic connection structure transmits one or more data packets to another client in said dynamic connection structure;

a client in said dynamic connection structure transmits information to a server regarding a client which requires removal from said dynamic connection structure.

14. A method of modifying a client in a dynamic connection structure's active connections comprising the following steps:

a client or server sends the client new connection information, which includes information referencing clients with which connections are required;

said client which receives said information completes transmissions over connections that are required to be closed, and then closes said connections;

said client establishes connections with clients, as specified in said new connection information.

15. A method of modifying the active connections of a client in a dynamic connection structure comprising the following steps:

a client or server sends the client new connection information, which includes information referencing clients with which connections are required, and also includes new connection information for any of said clients;

said client which receives said information completes transmissions over connections that are required to be closed, and closes said connections;

said client establishes connections with clients, as specified in said new connection information;

said client sends new connection information to any of said clients which require new connection information.